Claims

1. Process for the modeling of photographic images which are produced by light modulators that modulate an intensity of incident light with respect to the spectrum according to light modulation data, wherein an image reproduction system model determines the light modulation data of the light modulators in response to image control data, the process comprising the steps of :

a) calculating light modulation values (C_i) of the light modulators used for the image reproduction based on the input image control data by modeling the response of the image reproducing system model to the input image control data;

b) calculating, on the basis of the calculated light modulation values, modulation color values which describe the color values of the image which is represented by the light modulators and is generated upon light falling onto the light modulators.

2. Process for the modelling of photographic image data which control the production of a given image by way of an image reproduction system model, wherein the image reproduction system model reproduces the image by way of light modulators which modulate the intensity and/or spectrum of the incident light according to light modulation values, wherein the image reproduction system model determines the light modulation values of the light modulators in response to image control data, the process comprising the steps of:

a) calculating light modulation values (C_i) based on modulation color values which describe the color values of the image reproduced by the light modulators upon light falling onto the image;

b) based on the calculated light modulation values, calculating image control data corresponding to the image which lead to the production of the image by way of light modulators when they are input into the image reproducing system model, in that the modeled answer of the image reproducing system model to incoming image data is inverted.

3. Process according to claim 1 or 2, wherein multiple types of light modulators are present, with each type of light modulator having given spectral modulation properties, and the process comprises the further step of determining the modulation strength, which is achieved in image portions by light modulators of one specific type, by way of the image reproducing system model, whereby the modulation strength depends on the image control data, which dependency is taken into consideration for the modeling of the answer of the image reproducing system model to the input image data.

4. Process according to claim 3, wherein the light modulation values describe the modulation strength of the light modulators in the image regions and the process comprises the further step of relating the light modulation values (C_i) to the modulation color values (Lab) by way of the spectral modulation properties.

5. Process according to claim 1 or 2, wherein the step of modeling the answer of the image reproduction system model includes the step of describing the adaptation of the dynamic range of the color densities reproducible in the image control data color space to the dynamic range of the color densities reproducible by the light modulators.

6. Process according to claim 1 or 2, wherein the step of modeling the answer of the image reproduction system model includes the step of describing an over expression at the light modulators, wherein the over expression causes an overlapping of the spectral properties of the light modulators.

7. Process according to claim 1 or 2, wherein the step of modeling the answer of the image reproduction system model includes the step of describing an adaptation of the color tone range reproducible in the color space of the image control data to the color tone range reproducible by the light modulators.

8. Process according to claim 1 or 2, wherein the light modulators are pigments and the light modulation values determine at least one factor selected from the group of the concentration, the amount and the spacial distribution of pigments for a given set of pigments used for the image reproduction.

9. Process according to claim 1 or 2, comprising the step of relating the light modulation values with the modulation color values by considering the light incidence, based on at least one factor selected from the group of the absorption, transmission and reflection spectra of the light modulators, the emission properties of the illumination light source, and the modeled light modulation properties of a medium, which is part of the image reproduction system model and on or in which the light modulators are positioned.

10. Process for the modeling of photographic images comprising the steps of first carrying out the process according to claim 1 and then, based on the modulation color values obtained, carrying out the process according to claim 2.

11. Process according to claim 10, whereby an ideal image reproducing system model is used as the basis for the determination of the modulation color values with the process of claim 1, and another, real image reproducing system model is used as the basis for the calculation of the image data with the process of claim 2, wherein in an ideal image reproducing system model the difference between the color values produced by the image control data of claim 1, and the modulation color values is smaller than in a real image reproducing system model, and the image control data of claim 2, are input into a real image reproducing system corresponding to the real image reproducing system model.

12. Software which, when running on a computer or loaded in a computer, initiates the computer to carry out the process according to claim 1 or 2.

13. Storage medium for a computer program comprising the software according to claim 12.

14. Printer or scanner, comprising a control device for carrying out the process according to claim 1 or 2.

15. Printer according to claim 14, whereby image control data calculated by use of the process according to claim 2, are input into the control device of the printer and the image reproducing system model mirrors the properties of the printer and the medium used by the printer.

16. Photolab, comprising a control device for carrying out the process according to claim 1 or 2.

17. Photolab, comprising a printer or scanner according to claim 14.

18. Photolab according to claim 16 or 17, wherein the photolab is minilab or a large scale lab.

19. Photolab according to claim 18, wherein the control device is a computer.

20. Use of a model for an image reproducing system for the generation of photographic images in a process, an apparatus, a program or a business model, wherein the photographic images are reproduced by light modulators which modulate the intensity and/or spectrum of the incident light and the light modulation values of which describe the light modulation by the light modulators and whereby the image reproducing system model determines the light modulation values of the light modulators in response to image control data, the model comprising the steps of:

generating a relationship between light modulation values (C_i) and the input image control data by modeling of the answer of the image reproducing system model to the input image control data; and

generating a relationship between the modulation color values of an image and the light modulation values (C_i) based on a modeled light incidence onto the light modulators.

21. Use according to claim 20, wherein the model uses process steps according to claim 1 or 2.